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Informal Comments

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Title of the Invention: Diaphragm for Loudspeaker and Loudspeaker

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Dear Sir/Madam;

The applicants, who received the International Search Report and the Written Opinion of the International Searching Authority relating to the above identified International Application transmitted on 1st March 2005, hereby file Informal Comments as in the attached sheets.

Very truly yours,



TAKAYAMA, Michio

Attachment: Informal Comments

INFORMAL COMMENTS

International Application No.: PCT/JP2004/018283

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Applicant: FOSTER ELECTRIC CO., LTD., SAITO, Fumio and MIKUNIYA, Takashi

1. Comparison between the present invention and that disclosed in Document 1 (Japanese Patent Laid-open Publication No. 2001-112085A)

(1) An object of the present invention is to provide a vibrating plate capable of preventing generation of vibrations in the axisymmetric resonance mode in the upper register where conspicuous peaks and dips in the frequency characteristic are often generated, reducing the peaks and dips, and ensuring the smooth frequency characteristic in the entire register.

To achieve the object described above, in the present invention, a plurality of slits (14, 14a) extending from the central portion towards the outer circumference of a vibrating plate body (12) are provided, and the slits (14, 14a) are filled with filler (15) made of a material different from that of the vibrating plate body (12).

(2) In Document 1, the resonance mode generated due to various factors including forms and materials of members for an electro-acoustic transducer such as a vibrating plate and a cap is distributed in order to suppress generation of peaks and dips in the midrange as well as in the upper register for improving the sound quality, and therefore, Document 1 has some part in common with the present invention in its object.

In the present invention, however, peaks and dips especially in the upper register are reduced, while in Document 1 it is stated that peaks and dips in a range from the midrange to the upper register are reduced, thus, the two inventions are different from each other in this point.

Furthermore, in Document 1, as a means for improving sound quality in a range from the midrange to the upper register, elastic bodies made of rubber and having a cellular structure are laminated to and integrated into a member such as a vibrating plate and a cap in the thickness direction, simultaneously when the member is molded.

(3) Document 1 does not disclose the feature that "a plurality of radial slits are formed in a vibrating plate body and the slits are filled with filler made of a material different from that of the vibrating plate body". Therefore, there is nothing in common between the structure disclosed in Document 1 and the structure of the present invention, and the two inventions are substantially different from each other.

2. Comparison between the present invention and that disclosed in Document 2 (Japanese Patent Laid-open Publication No. S54-29696A)

- (1) In a broad sense, the invention disclosed in Document 2 has something in common with the present invention in the point that the frequency characteristics are improved.

However, the present invention is to improve the frequency characteristic in the upper register by reducing peaks and dips especially in the upper register, while the object of the speaker in Document 2 is to improve the frequency characteristic in a frequency range extending from a low frequency to a high frequency, and thus, the two inventions are different from each other in this point.

- (2) Furthermore, the vibrating plate according to the invention disclosed in Document 2 has a configuration in which a plurality of vibrating pieces each having a substantially fan-like form are overlaid at both edges of each piece and jointed to each other, with their fibrous directions changing alternately.

The configuration is substantially different from the configuration of the present invention in which a plurality of slits are formed in a vibrating plate body and the slits are filled with filler made of a material different from that for the vibrating plate, and therefore, there is no feature common between the configurations of the two inventions.

3. Comparison between the present invention and that disclosed in Document 3 (Japanese Patent Laid-open Publication No. H 5-328485A)

- (1) In a broad sense, the invention disclosed in Document 3 has something in common with the present invention in the point that the invention provides an acoustic vibrating member with an improved acoustic characteristic. However, a main object of the invention disclosed in Document 3 is to provide a light weight acoustic vibrating member with an extremely high elasticity modulus, being different from the object of the present invention.

- (2) The acoustic vibrating member in Document 3 is a hardened body obtained by after impregnating paper or cloth with a hardening composite containing a hardening phosphazene compound as a main ingredient and loading a pressure to the paper or cloth, or, after molding paper or cloth in advance and impregnating the paper or cloth with a hardening composite containing a hardening phosphazene compound as its main ingredient, polymerizing and curing the hardening phosphazene compound to integrate the phosphazene-based resin. Therefore, there is no feature common between the invention disclosed in Document 3 and the

present invention, and the two inventions are substantially different from each other.

4. Comparison between the present invention and that disclosed in Document 4 (Japanese Patent Laid-open Publication No. H 4-120900A)

(1) The objects of the invention in Document 4 is to raise surface hardness of a vibrating plate easily, as well as with low cost, and also to provide the anticorrosive effect in a case of a metallic vibrating plate. Therefore, the invention in Document 4 is different from the present invention in its objects.

(2) A surface of the vibrating plate in Document 4 is coated with a polyphosphazene resin, and the configuration is substantially different from that of the present invention.

5. Conclusion

For the reasons as described above, we consider that any of Documents 1 to 4 does not disclose the features of the present invention, namely,

- 1) a plurality of radial slits are formed in a vibrating plate body, and
- 2) the slits are filled with filler made of a material different from a material for the vibrating plate body,

and thus, that the present invention could not be anticipated even by those skilled in the art from the documents above.

Therefore, we consider that the present invention has the sufficient progressiveness.